Integrated 2W Class-D Stereo Amplifier, Hardware EQ/DRC, Digital Microphone, Apple/Nokia Headset Detect/Switch, Universal Jack, and Full-Duplex I^{2}S

Product Overview

Conexant's CX20754 is a low-power, 102dB SNR, HD audio CODEC aimed at delivering high-quality audio for the mobile PC market, including notebooks, ultrabooks, and tablets.

Compliant with Intel's HD audio specification 1.0a, the CX20754 has audio fidelity that exceeds Microsoft premium logo requirements. With two 24-bit stereo DACs operating at sampling frequencies up to 192kHz and two 24-bits stereo ADCs operating at sampling frequencies up to 96kHz, the CX20754 can support multi-streaming and real-time communications applications. By combining these hardware features with Conexant's proprietary voice and speech processing algorithms, the new CODEC offers the ideal solution for platforms needing Microsoft Lync and Skype certification.

The CX20754 has an integrated stereo filterless class-D amplifier with patented common mode scrambling technology capable of driving 2Wrms per channel at 1% THD+n into a 4Ω load and up to 2.8W with higher distortion.

Devices and speakers are protected with DC detection at the load, HPF, short-circuit, over-current, over-temperature protection, and power averaging.

Built-in five-band hardware EQ and DRC optimizes speaker loudness without distortion to enable a high-quality audio experience from the mobile PC's internal speakers, independent of the driver and operating system. Lock protection provides speaker and microphone safeguards to prevent disabling by hackers.

The tri-state, ProCoustic capless headphone driver produces a full-range frequency response, and eliminates external components for supporting headset and headphones. In-line command sensing is included, which enables control of third-party applications directly from the headset, including Skype, Media Player, and iTunes. A single universal jack supports headsets, headphones, external microphones, and line-in devices. A PDM single-bit stream interface allows for the support of two digital microphones for dual microphone array implementations.

Conexant's PopShield technology suppresses pops and clicks during all transition states, and includes active DC offset removal and innovative Vref ramping. D3Live allows external audio devices to play through internal speakers with full speaker EQ/DRC while in system stand-by. D3Live is supported with no external BOM and does not require an extra crystal.
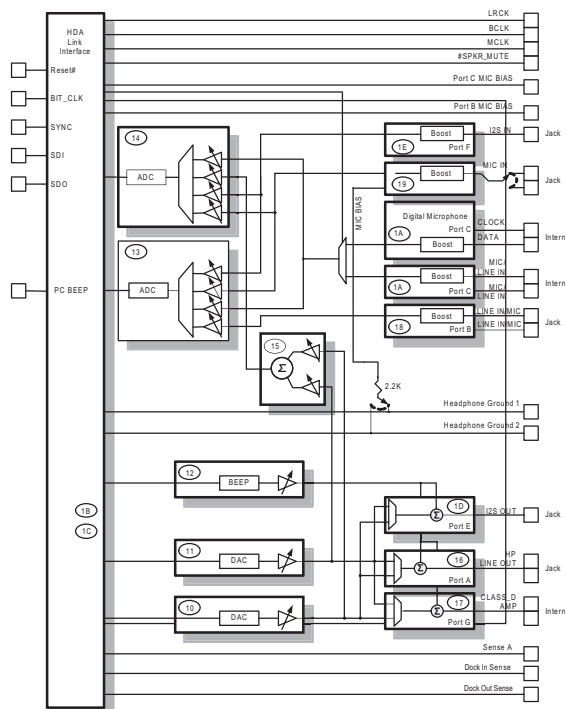
The CX20754 has D-Flex power management that exceeds Intel's ECR 15B requirements, and consumes minimum power during standby by powering down the DAC, ADC, and amplifiers without pops and clicks.

The full-duplex I^{2}S audio interface with programmable drive strength and inversion is ideal for digital docking I/O expansion or digital amplifiers.

Conexant offers comprehensive audio software driver support, including proprietary and third-party software APOs. The third-party APO includes Andrea Electronics, Creative Labs, Dolby, MaxxAudio, Sonic Focus, SRS, and more.

Conexant's Smart Source Pickup (SSP) is a voice and speech processing algorithm suite that ensures clear voice communication and speech command and control in noisy environments. The SSP does not use or rely on beam forming, and provides an easy-to-use powerful solution that requires few or no user controls. The SSP passes the latest Intel ASR certification in portrait and landscape modes, and accomplishes all this with just two microphones. The SSP is available for Windows, Linux, and Android. Conexant also offers keystroke, tap, and fan noise suppression.

System Block Diagram

System Compatibility

- Windows XP/Vista/7/8.x
- Microsoft Windows/Vista/7/8.x Premium Logo
- Linux
- Android

Applications

- Notebooks
- Ultrabooks
- All-in-one PCs
- Tablets
- Embedded applications

Key Features

- HD audio CODEC, compliant with Intel HD audio specification v1.0a
- Two pairs of independent DACs and ADCs that support audio formats ranging from 16-bit to 24- bit, 44.1kHz to 192kHz for DAC, and 44.1kHz to 96kHz for ADC
- Stereo class-D amplifier provides:
  - 2Wrms per channel at 1% THD+n
  - Up to 2.8Wrms per channel at 10% THD+n into a 4Ω load with spread spectrum and common mode scrambling
- Five-band hardware EQ and DRC ensures the best speaker audio performance, and maximizes loudness while preventing distortion—independent of the driver and OS
- SpeakerShield technology provides load-based speaker protection independent of driver and application—protection includes DC, short, near-short, temperature, and power averaging
- ProCoustic capless stereo headphone driver eliminates need for an external amplifier
- Integrated capless headset with auto-detect and switch between the GND and Mic pins
- Headphone boost supports up to 1.5Vrns directly from the CODEC outputs to drive higher impedance headphones/earbuds without an external amplifier and performance degradation
- A single universal jack supports headsets, headphones, external microphones, and line-in devices
- Headphone limiter supports the EN50332-2 GS mark without an external BOM
- Digital microphone PDM interface with boost supporting two digital microphone elements and DC offset removal

- Master I^2S transmitter and receiver with selectable signal inversion and programmable drive strengths can be used for direct connection to external devices and docking stations
- Microphone security prevents unwanted recordings from any or all input ports
- PopShield pop and click suppression
- Microphone boost settings:
  - Digital = 0dB, 12dB, 24dB, 36dB, and 48dB
  - Analog = 0dB, 10dB, 20dB, 30dB, and 40dB
- D3Live allows external audio devices to play through internal speakers with full speaker frequency response compensation while in system stand-by
- Digital mixer used for recording a mix of audio from the DACs and analog sources
- D-Flex enhanced power management with wake-on-beep
- Analog and digital PC BEEP are supported—wake-on-beep never misses a BEEP, even when in low-power mode
- GPIO for custom applications
- 1.5V and 3.3V HD audio signaling
- I^2S dock jack senses for output and input dock jacks eliminate external BOM
- Jack sense detects up to four jacks using one sense pin
- 5V to 3.3V LDO for improved audio performance, eliminating the need for an external regulator or a power transistor
- Compatible with all Windows versions and Android—ALSA Linux driver is available
- SmartAudio GUI-advanced graphical audio control interface
- Proprietary software DSP value-add:
  - Stereo AEC
  - End-to-end noise reduction
  - SSP
  - Keystroke, tap, and fan noise suppression
  - Phantom bass and speakers
  - 3D headphones
  - 10-band parametric EQ with sub-band dynamic range compression
- Third-party software DSP:
  - Andrea
  - Creative Labs
  - Dolby
  - Fortemedia
  - SRS
  - Synopsis (Sonic Focus)
  - Waves
- 56-pin 7x7mm QFN

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